SPINAL MUSCLE ACTIVITY IN SIMULATED RUGBY UNION SCRUMMAGING IS AFFECTED BY DIFFERENT ENGAGEMENT CONDITIONS

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Introduction

- Previous kinetic and kinematics studies on machine (1) and live (2) scrummaging identified that the '**crouch-bind-set**' (CBS) engagement condition led to **a reduction of the biomechanical load** experienced by front row players when compared to '**crouch-touch-set**' (CTS)
- This reduction in spinal loading may affect the player's spinal muscle activity through the scrum

Aim

- To evaluate the effect of 3 simulated scrummage conditions (Figure 2) on erector spinae, upper trapezius and sternocleidomastoid activity:
  - *Crouch-Touch-Set* (players engage and bind simultaneously)
  - *Crouch-Bind-Set* (players pre-bind before they engage)
  - *Two versus one Live condition* (passive engagement)

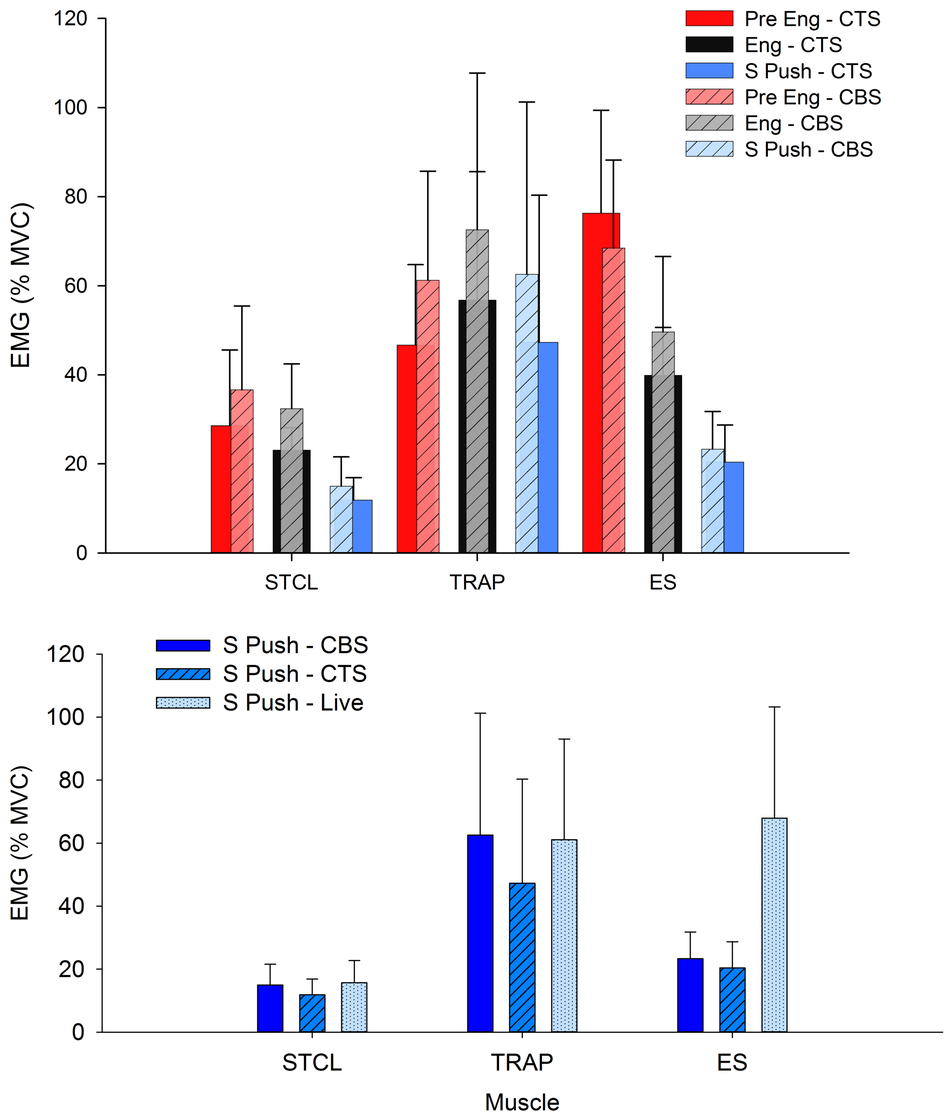


Figure 1. STCL (sternocledomastoid), TRAP (trapezius) and ES (erector spinae) muscles activation in Pre Engagement, Engagement and Sustained Push scrum phases, across CBS, CTS and Live conditions.

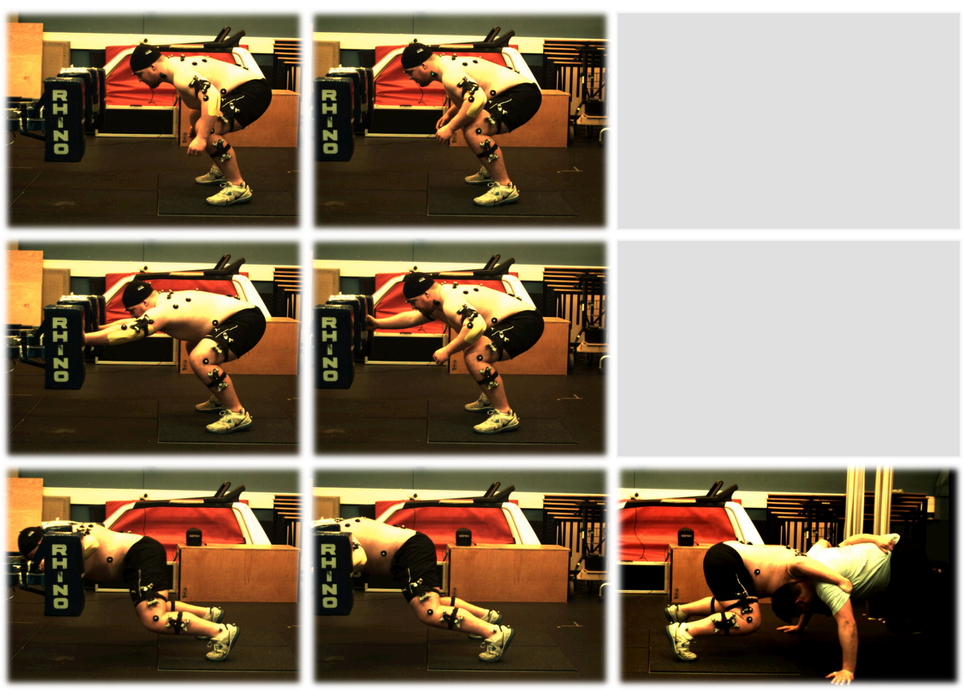
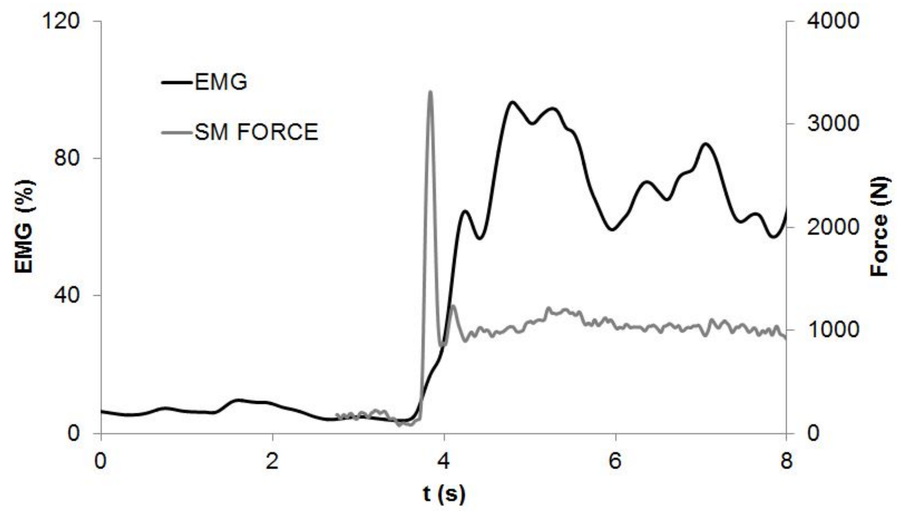


Figure 2. Scrum engagements (Crouch-Bind-Set) – (Crouch-Touch-Set) - Live

Results

- The activity of the upper trapezius and sternocleidomastoid tended to be higher in CBS than CTS condition, significantly so ($p < 0.05$) during the engagement phase (Figure 1).
- Erector Spinae activity was significantly higher in the live condition than either the CBS or CTS during the sustained push.



Discussion

- The increased activity of the upper trapezius and sternocleidomastoid in the CBS condition suggest that the pre-bind, prior to engagement, may better prepare the cervical spine by increasing stiffness during the engagement phase, where contact forces are higher and potentially more hazardous.
- Machine scrummaging does not replicate the muscular demands of the erector spinae in live scrummaging, and for this reason, we advise novice rugby union forwards to practise scrummaging in live situations to improve their lower trunk stiffening strategies.

References

(1) (1) Preatoni et al. (2014). BJSM [Epub ahead of print] 10.1136/bjsports-2013-092938
(2) (2) Cazzola et al. (2014). BJSM [Epub ahead of print] doi: 10.1136/bjsports-2013-092904

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